REMARKS

Reconsideration of the Application is respectfully requested.

I. Claim Status

Claims 1-11 are currently pending and stand rejected.

Claim 1 has been amended to claim a continuous transparent conductive film having a thickness of 2 to 9 nm. Support for this amendment can be found, for example, on page 2, paragraph 28 of U.S. Patent Publication No. 2006/0285213 A1.

II. Claim Rejections

Claims 1 and 3 -11 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Mukherjee (U.S. 4,959,257) in view of the Examiner's statement of ordinary skill in the art.

The Examiner contends that Mukherjee teaches transparencies comprising a transparent substrate (such as glass) having a conductive film formed thereon. The Examiner states that the conductive film may comprise indium tin oxide and that the indium tin oxide film may have a thickness of 10 to 200 nm. The Examiner states that it would have been obvious to one having ordinary skill in the art to select a thickness within the presently claimed range based on Mukherjee. The Examiner considers the roughness cited in claims 3 and 4 and the optical properties recited in claims 9-11 as inherent in Mukherjee. Finally, the Examiner states that since claims 7 and 8 merely recite a process where the product is not materially different than the product in Mukherjee, the process limitations are therefore not seen to distinguish the claimed article.

Claims 1-11 are rejected under 35 U.S.C § 103(a) as being unpatentable over Suzuki (U.S. 7,309,531) in view of the Examiner's statement of ordinary skill in the art.

The Examiner contends that Suzuki teaches articles comprising a light transmitting substrate having a conductive film formed thereon. The Examiner states that the conductive film may comprise indium tin oxide and have a thickness of 10 to 500 nm. The Examiner states that it would have been obvious to one having ordinary skill in the art to select a thickness within the presently claimed ranged based on Suzuki. Furthermore, the Examiner contends that Suzuki teaches that the indium tin oxide film may comprise an aggregate of columnar single crystals as in claims 2, 5, and 6 of the present invention. The Examiner states that Suzuki teaches the maximum and average roughness, which overlap those presently claimed, and that it would have been obvious to one having ordinary skill in the art because Suzuki suggests the values. The Examiner considers the optical properties recited in claims 9-11 as inherent in Suzuki. Finally, the Examiner states that since claims 7 and 8 merely recite a process where the product is not materially different than the product in Suzuki, the process limitations are therefore not seen to distinguish the claimed article.

Applicant respectfully traverses the rejections.

A prima facie case of obviousness exists where the claimed ranges "overlap or lie inside the ranges disclosed by the prior art." *In re Wertheim*, 541 F.2d 257 (CCPA 1976). Claim 1 has been amended to recite a continuous transparent conductive film having a thickness of 2 to 9 nm. Neither Mukherjee nor Suzuki teaches that a thin continuous transparent conductive film of such thickness can be formed. Mukherjee teaches that the layer of a transparent conductive film can have a thickness of 10 to 200 nm, preferably 30 to 70 nm. (Mukherjee, Col. 2, lines 39-41.) Suzuki teaches that the thickness of the conductive film may be a certain or more thickness and is in a range of 10 to 500 nm or more preferably 20 to 200 nm. (Suzuki, col. 10, lines 50 – 59.)

A prima facie case of obviousness can exist where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775 (Fed. Cir. 1985).

Applicant can rebut a case of obviousness by showing that the art, in any material respect, teaches away from the claimed invention. *In re Geisler*, 116 F.3d 1465 (Fed. Cir. 1997).

Mukherjee's invention is to provide a transparency using gold film with limited mechanical and electrical failure. Mukherjee discloses a sputtered layer of indium tin oxide that is between 10 to 200 nm and most preferably 30 to 70 nm. (Mukherjee, Col. 2, lines 39-41.) Furthermore, the only example of the Mukherjee invention recited the layer at 50 nm. Even the prior art that Mukherjee cites lists the thickness of the oxide layer in a range of 10 to 80 nm and especially 20 to 60 nm. The thickness or thinness of an indium tin oxide layer was not considered in Mukherjee as a solution to address Applicant's problem to solve, which is a creating a high-transparent light transmitting substrate with a conductive film (Specification of Applicant's publication, p. 1, paragraphs [0001] and [0003]). One of skill in the art would not have considered Mukherjee's stated range of indium tin oxide layer thickness to address the problems of high-transparency because the crux of the invention in Muhkerjee was to increase mechanical and electrical problems and these solutions were found in the stated ranges of between 10 to 200 nm and more preferably 30 to 70 nm. Therefore it would not have been obvious to one skilled in the art to select a thickness of a layer within the range of 2 – 9 nm based on Mukherjee because Mukherjee teaches away from using a conductive film less than 10 nm and does not address the problems the Applicant wished to solve.

Suzuki teaches that the thickness of the conductive film may be a certain or more thickness and is in a range of 10 to 500 nm or further preferably 20 to 200 nm. Suzuki further states that when

the film is excessively thin, there is a problem in film strength or a hole transport capability at manufacturing time. (Suzuki, col. 10, lines 56-58.) Suzuki notes that an upper limit is not really limited, but felt the need to include the above statement to explain the lower limit. For these reasons, it would not have been obvious to one skilled in the art to select a thickness within the range of 2-9 nm based on Suzuki, due to the statement that an excessively thin film, that is a film with a thickness below 10 nm, creates problems with film strength or a hole transport capability.

Further it is noted that in the 2006/0285213 publication, in paragraph 0002, it states "It has been considered that, when the conductive film of the light transmitting substrate with a transparent conductive film is an ultrathin film at the nm level, a continuous film is not formed." Applicant noted within the specification that a prevalent thought in the scientific community at the time was that an ultrathin film at the nm level could not form a continuous film. Therefore, it would not have been obvious to one skilled in the art to create an ultrathin continuous film at the nm level, because it was thought that it could not be done. Applicant succeeded in the formation of an ultrathin continuous film at the nm level as a conductive film of light transmitting substrate with a transparent conductive film, thereby overcoming the previous problem in the field.

For these reasons, amended claim 1 would not be obvious in view of the teachings of Mukherjee or Suzuki. Accordingly, Applicant submits that amended claim 1 and dependent claims 2 through 11 are not obvious in view of the references and are in condition for allowance.

CONCLUSION

In view of the above remarks, it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining, which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

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Respectfully submitted,

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